



# **Innovative Technology Reduces Power Plant Emissions – Commercialization Success**

Presented by

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NASA Kennedy Space Center

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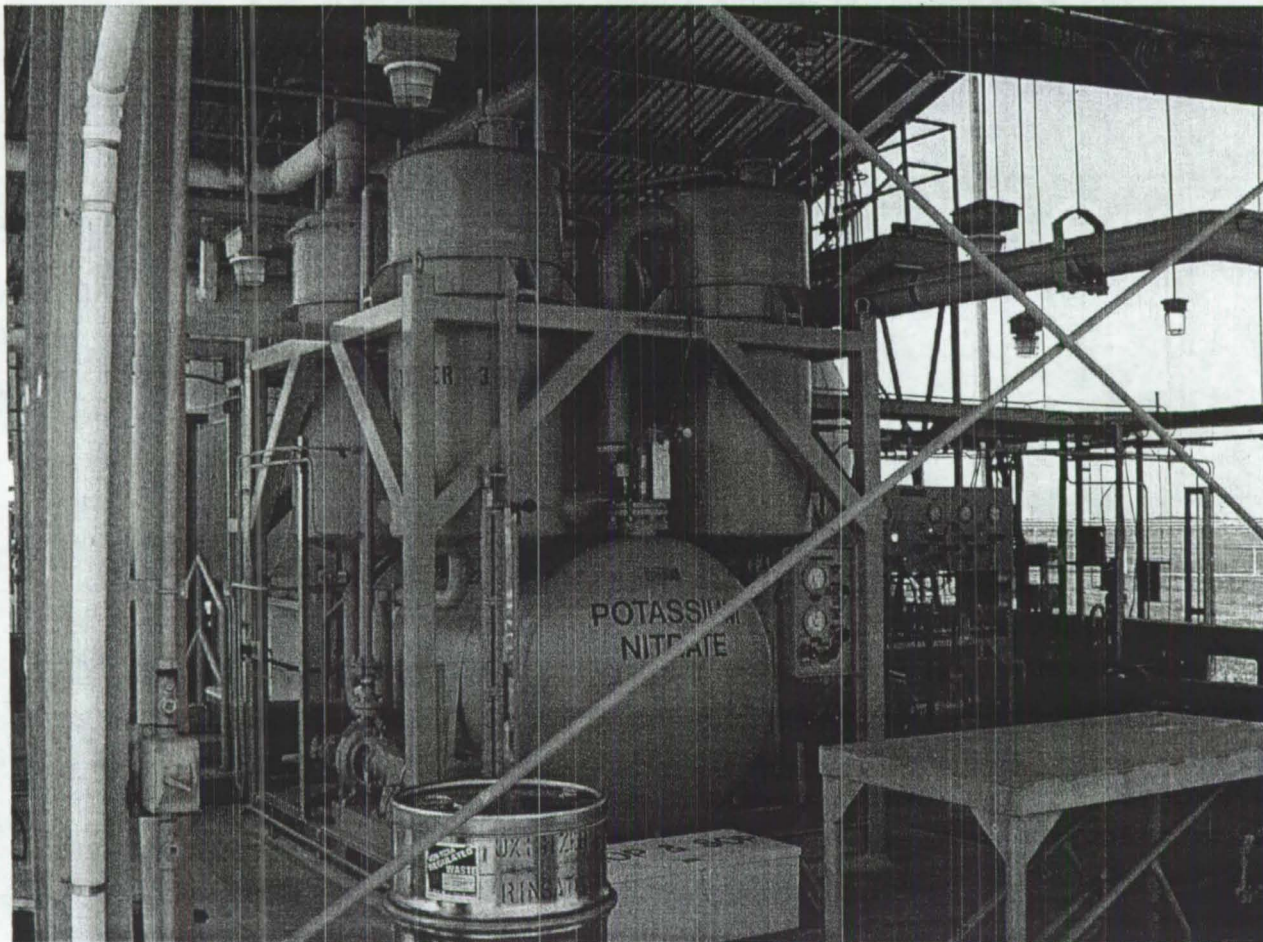


## **Overview of Emission Control System Development**

- Development of new oxidizer scrubber system to eliminate NO<sub>x</sub> waste and produce fertilizer
- Technology licensed and a 1 to 3 MWatt-scale prototype installed on power plant
- Development of method to oxidize NO to NO<sub>2</sub>
- Experience gained from licensing NASA technology



# Development of New Scrubber Liquor



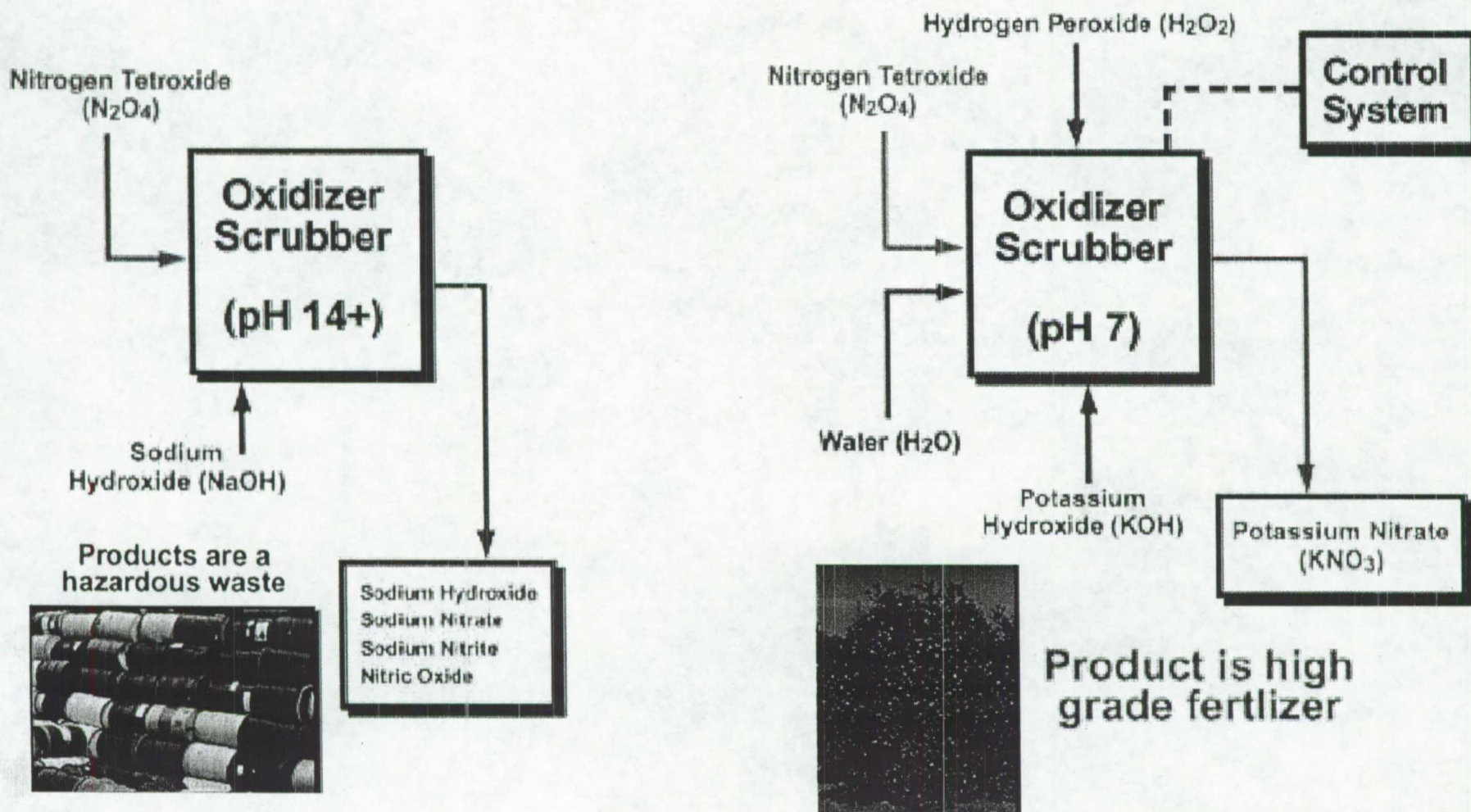




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## Transformation of Waste to Fertilizer



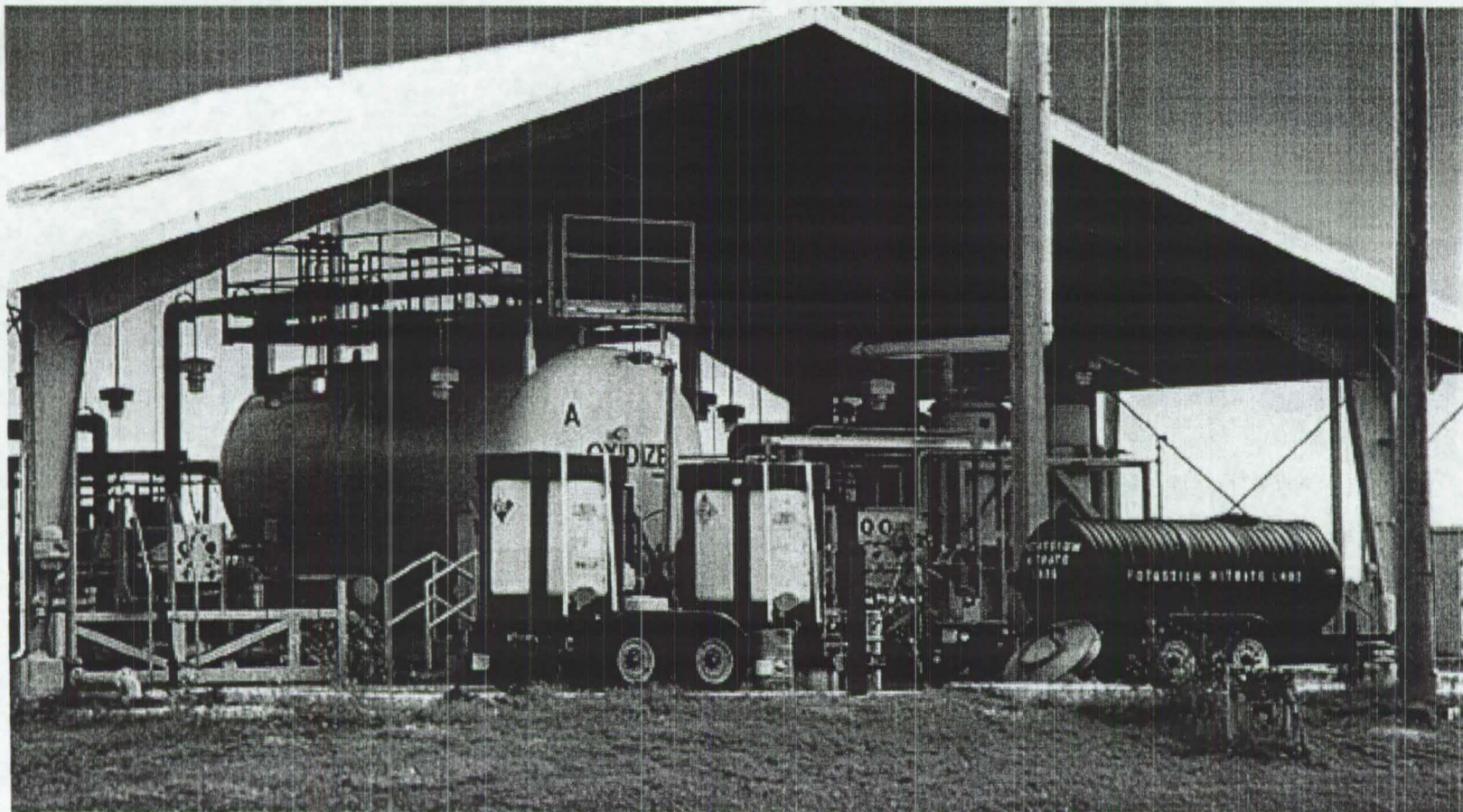




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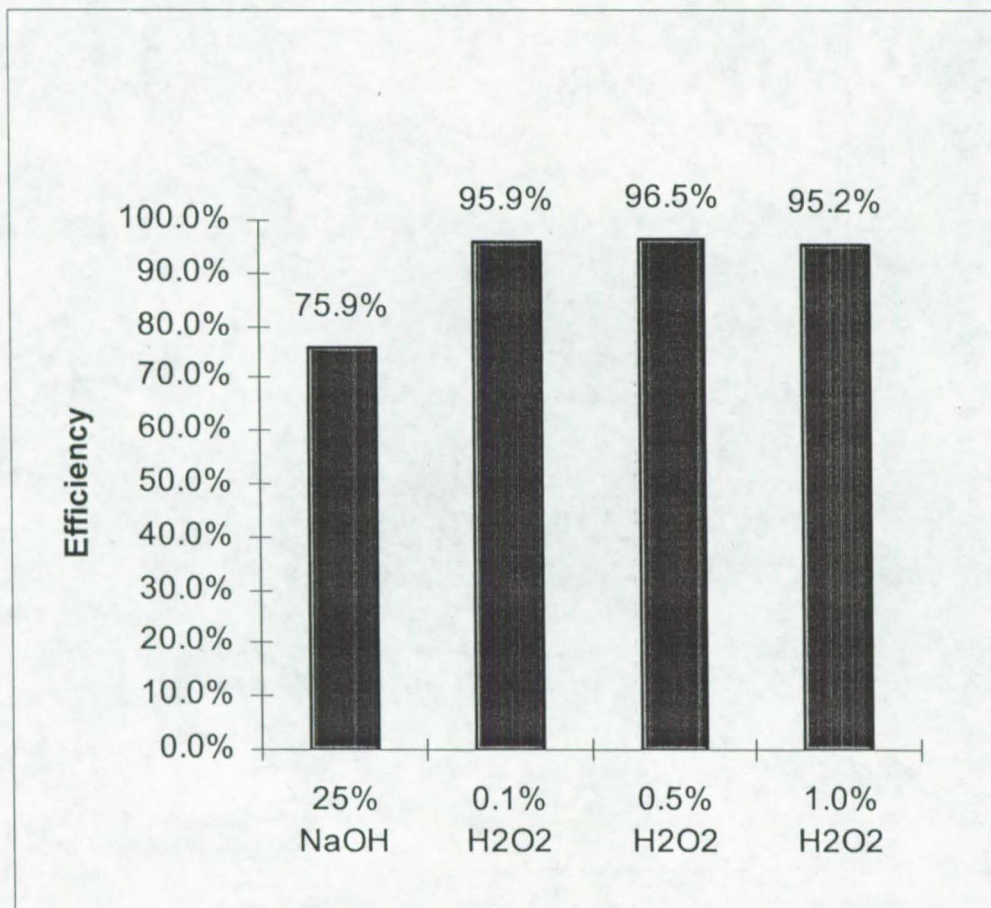
# New Scrubber Liquor System





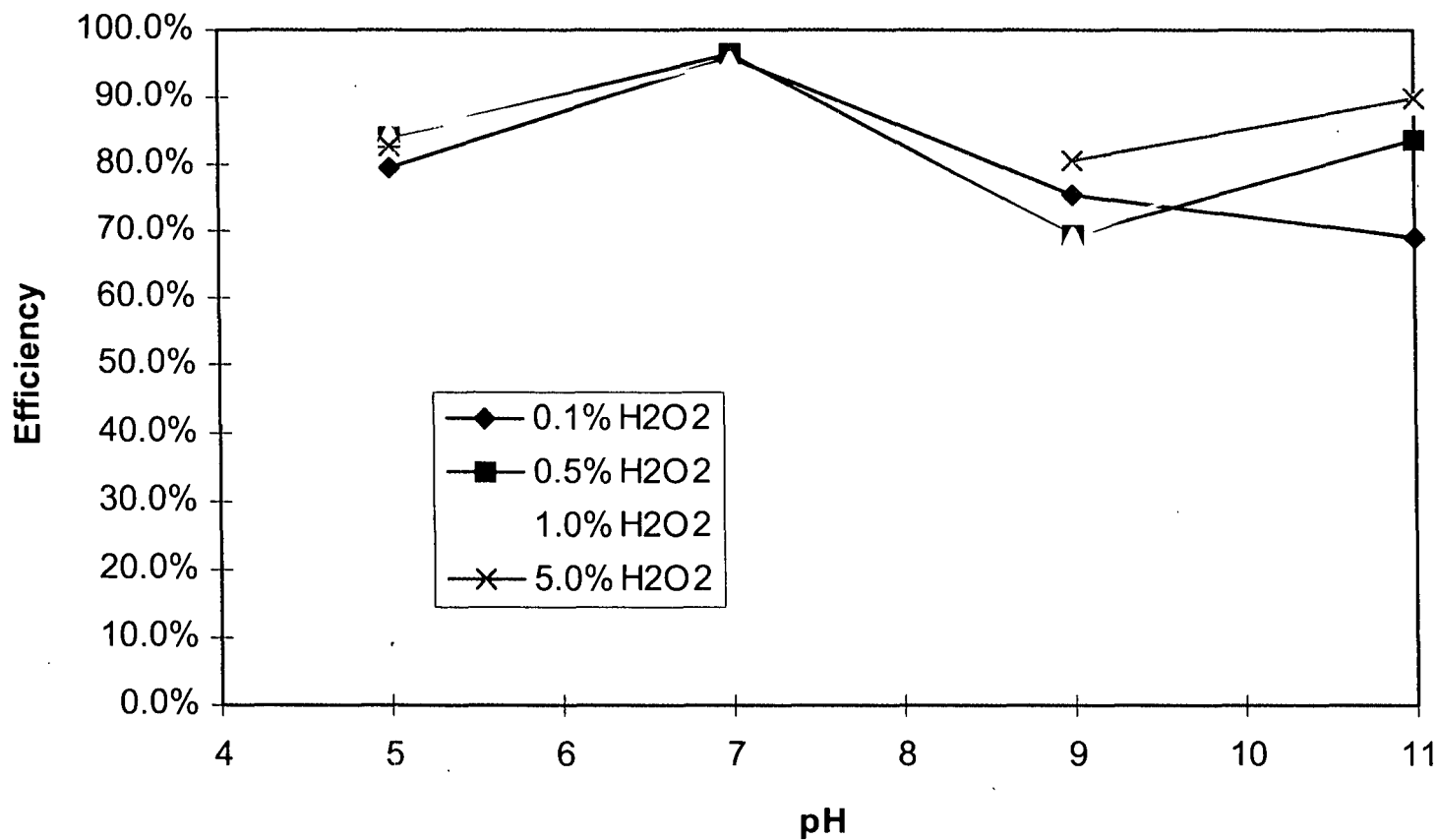


## Efficiency vs. Scrubber Liquors





## Efficiency vs. pH at Various Peroxide Concentrations



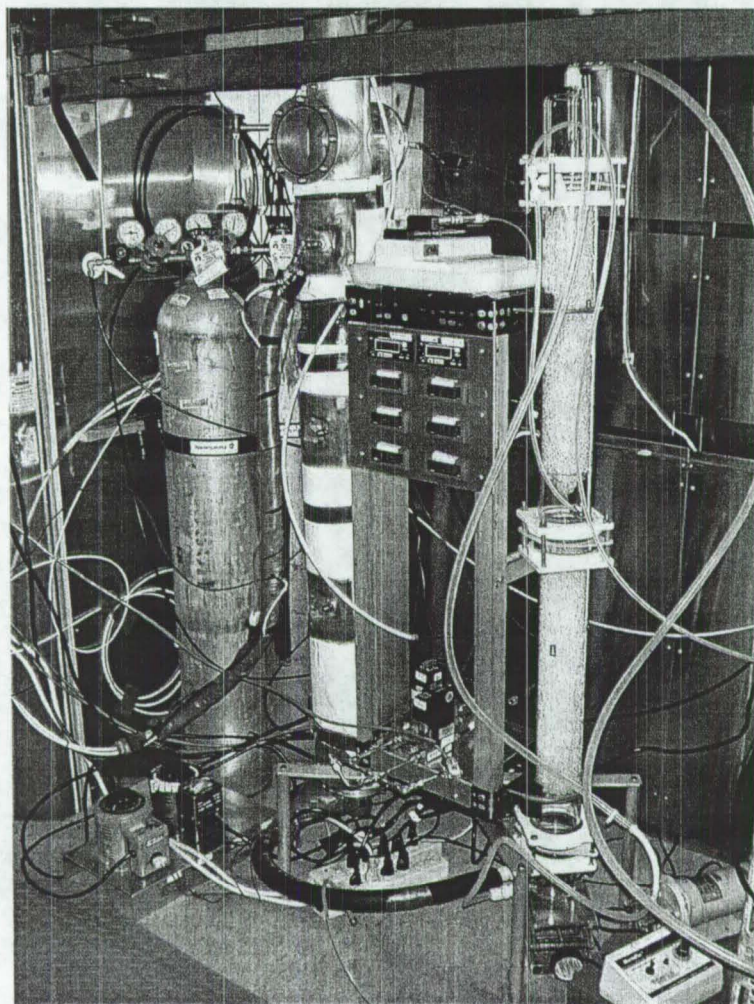




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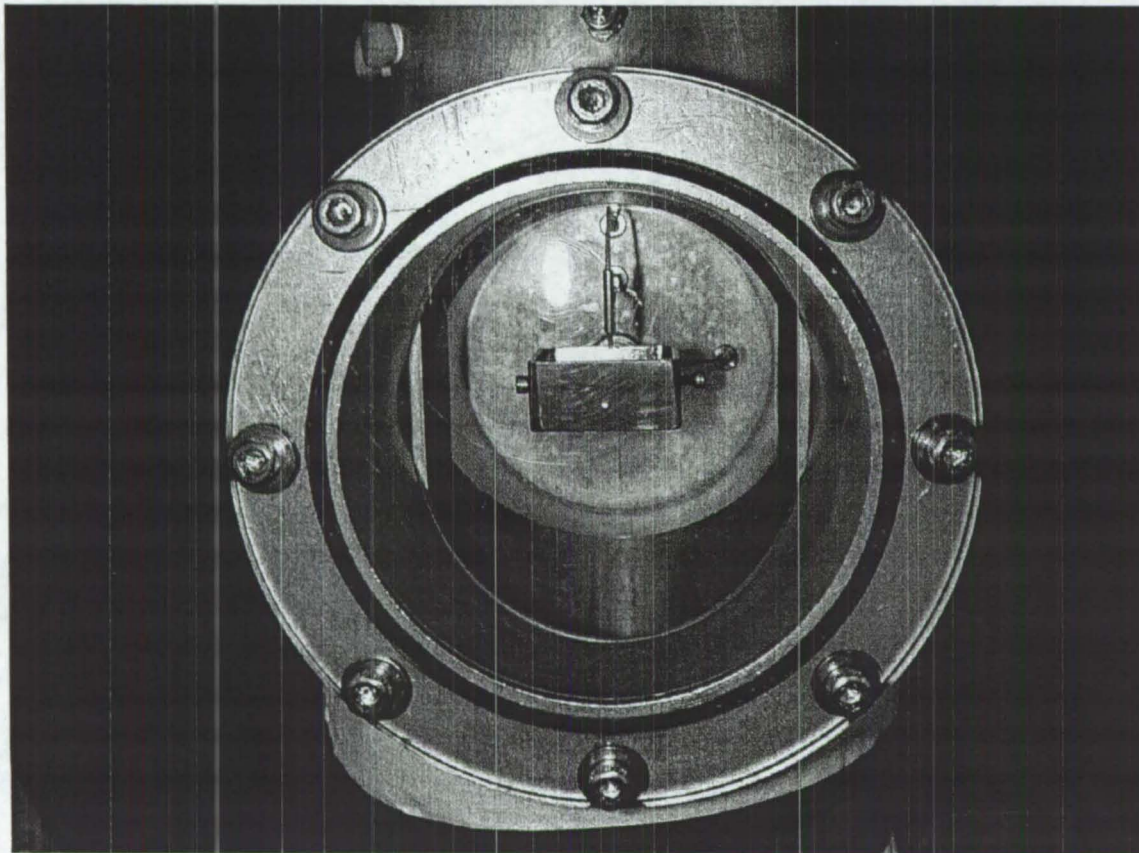
## NO Oxidation Testbed







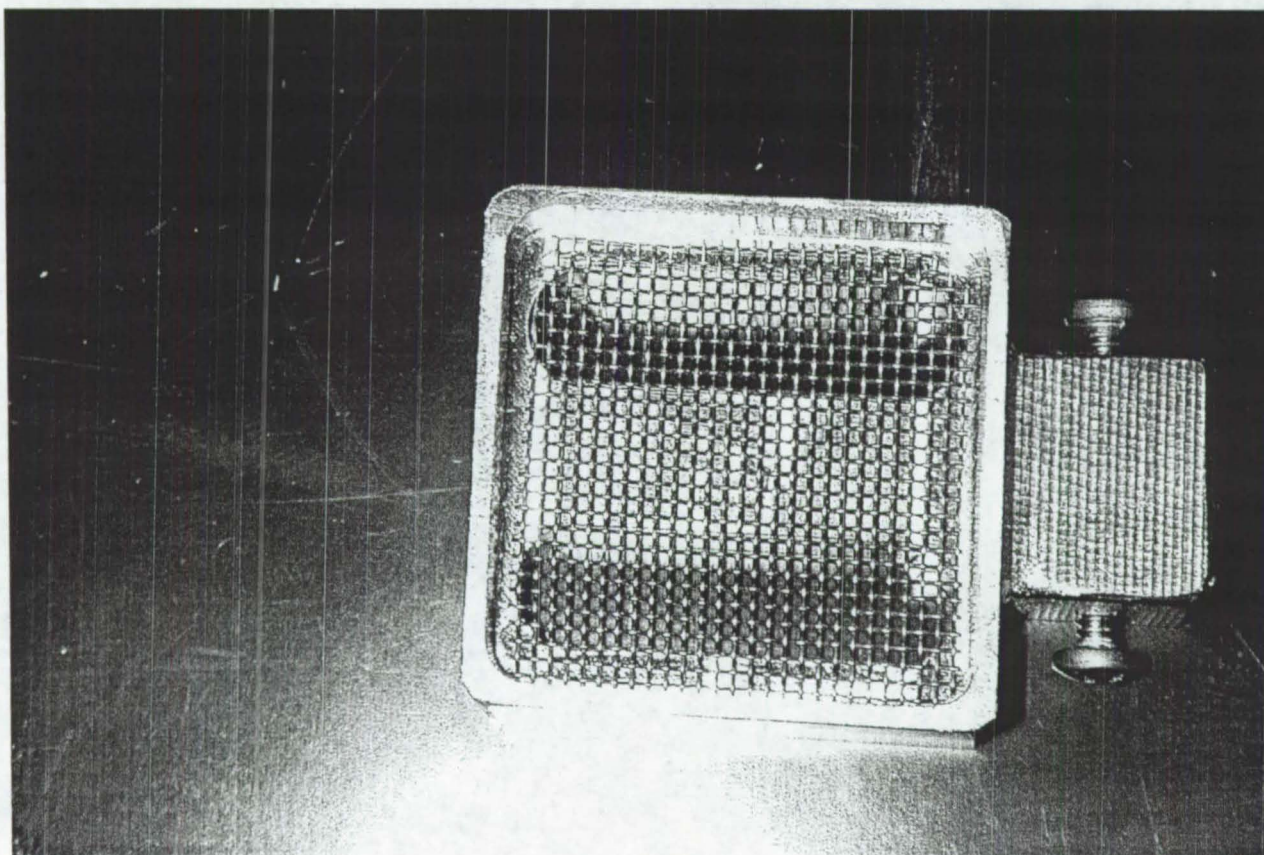
# Catalyst Support







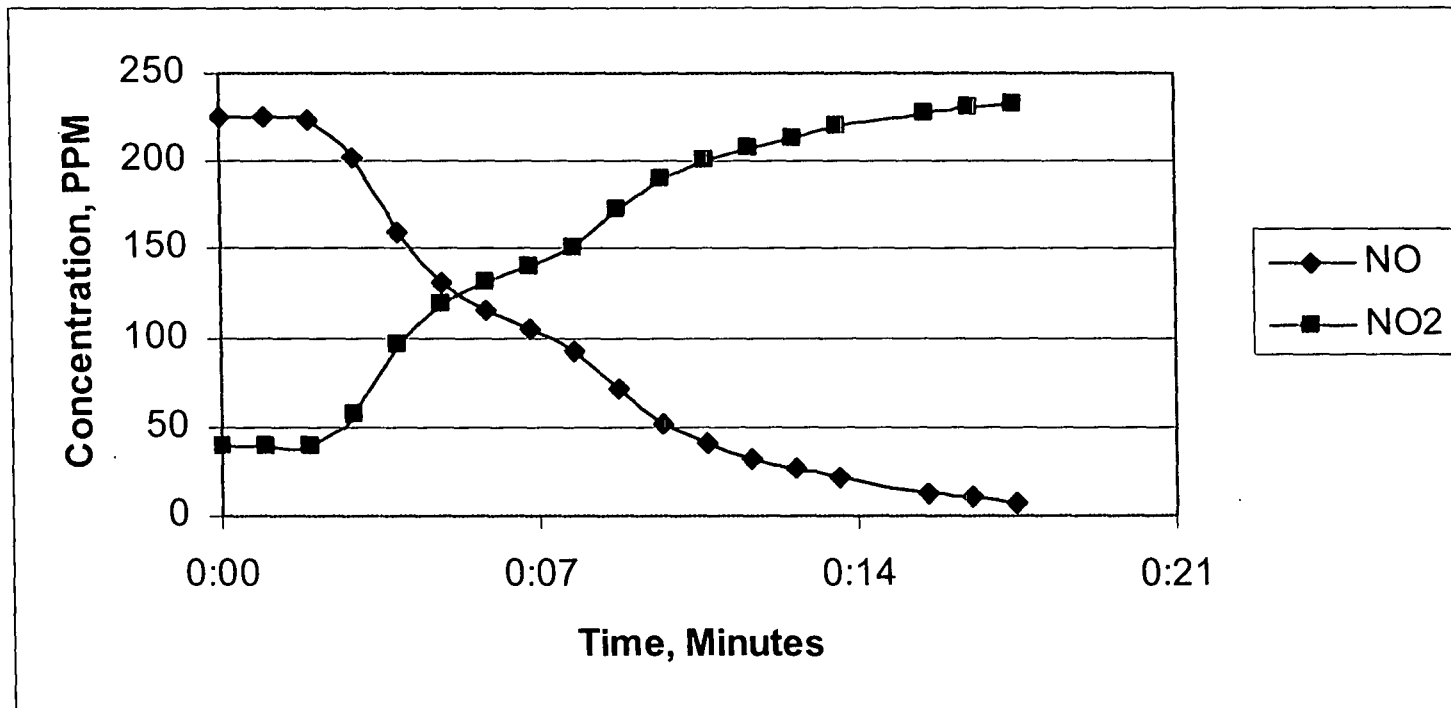
# Catalyst Holder





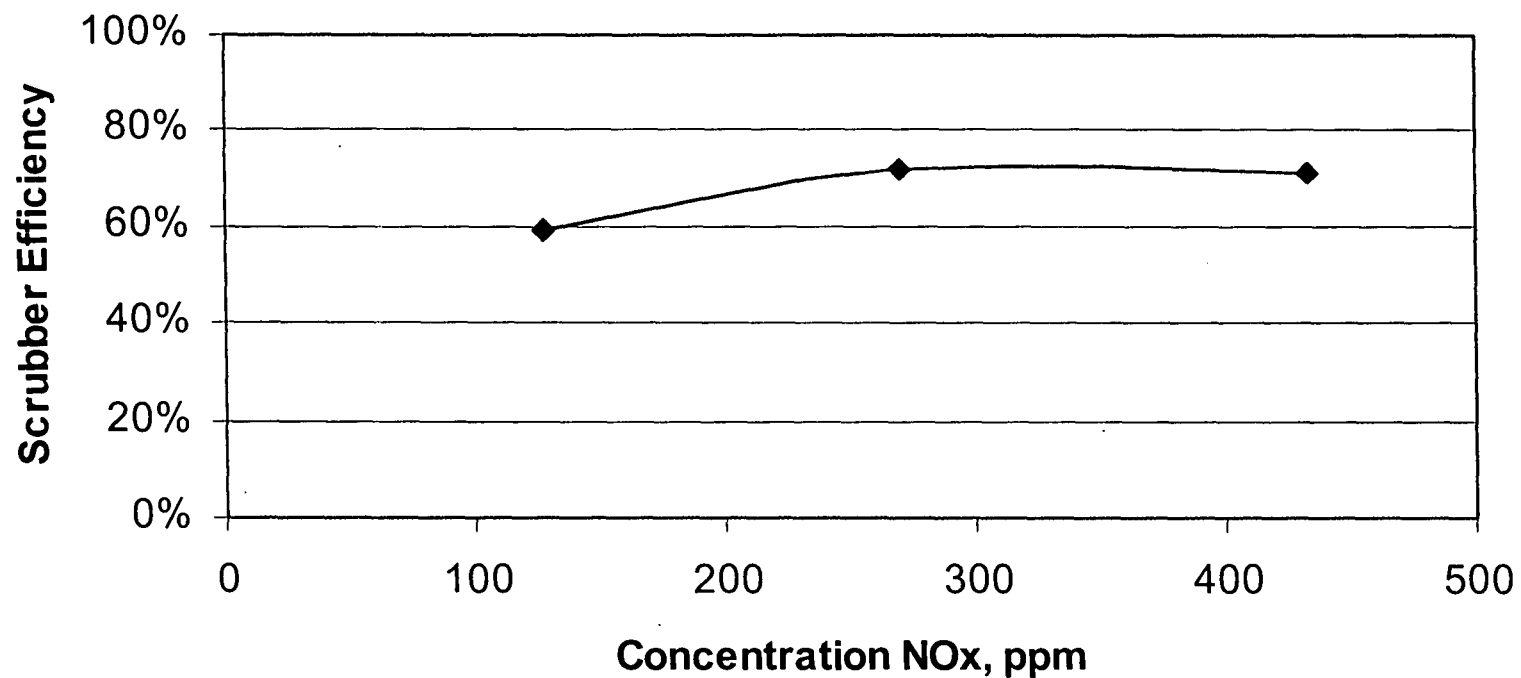


# Laboratory Conversion NO to NO<sub>2</sub>





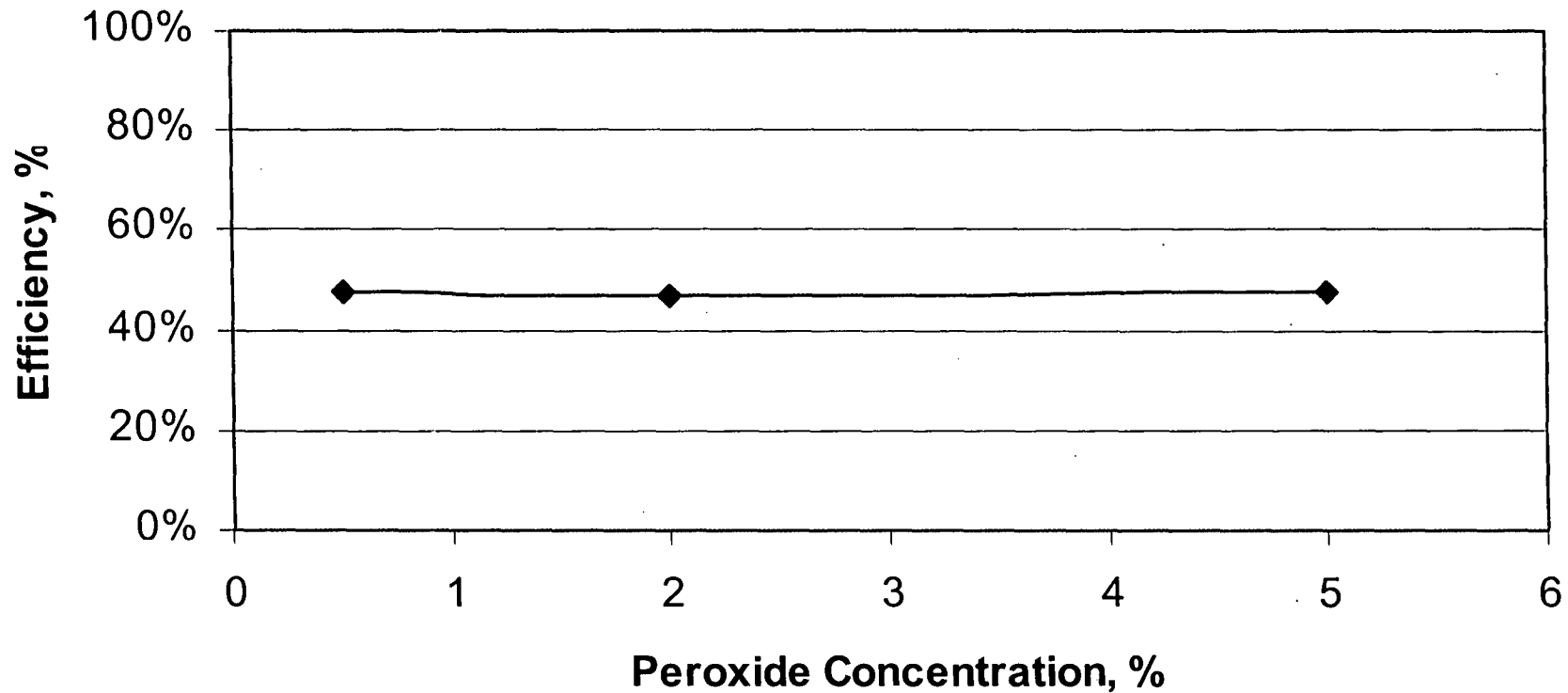
## Efficiency vs. NO<sub>2</sub> Concentration





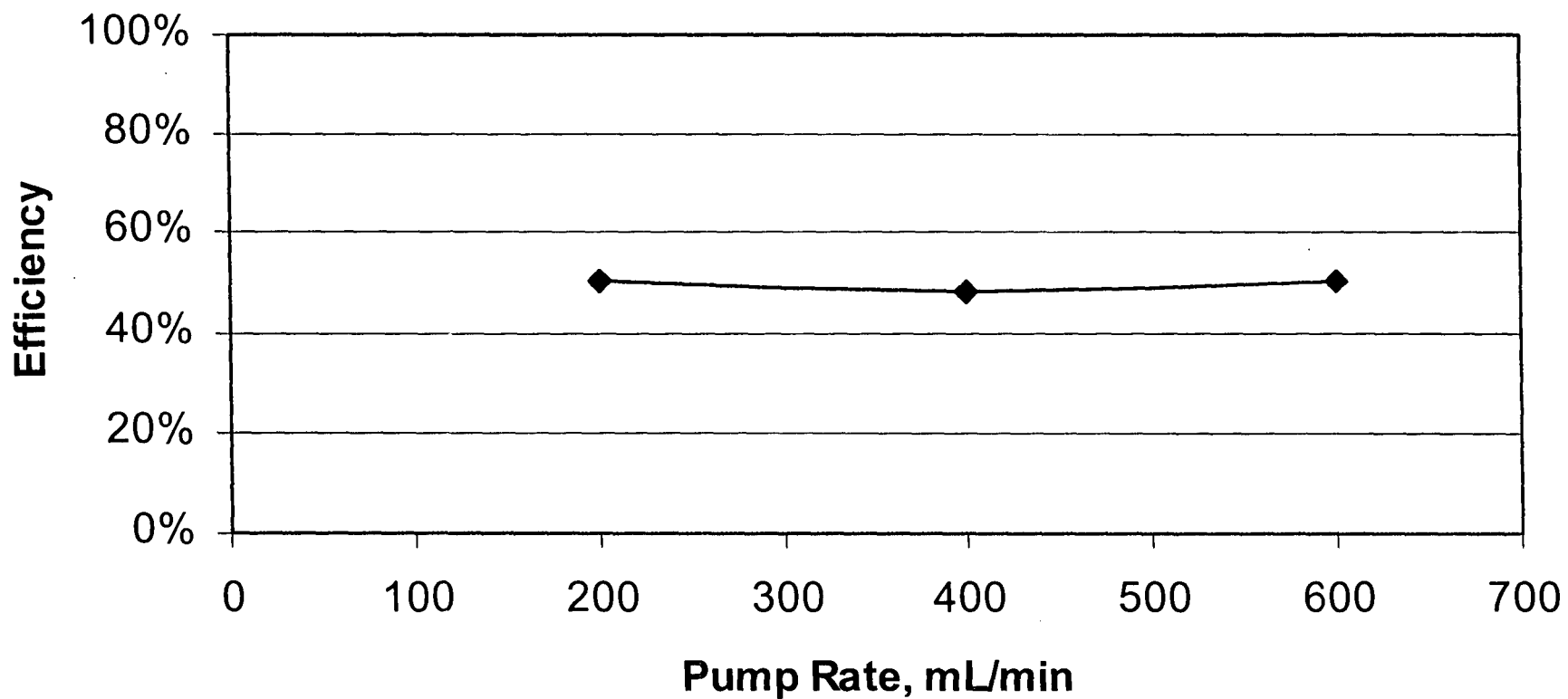


## Hydrogen Peroxide Concentration vs. Scrubber Efficiency





## Efficiency vs. Scrubber Pump Rate



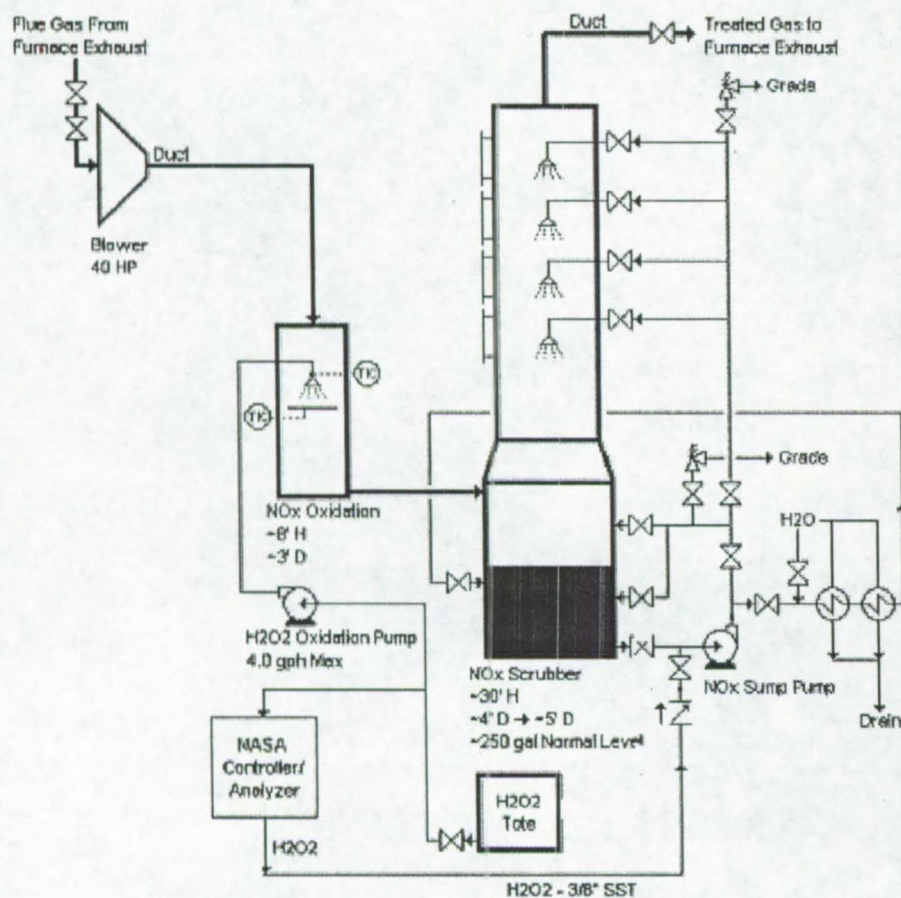




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# Initial Installation

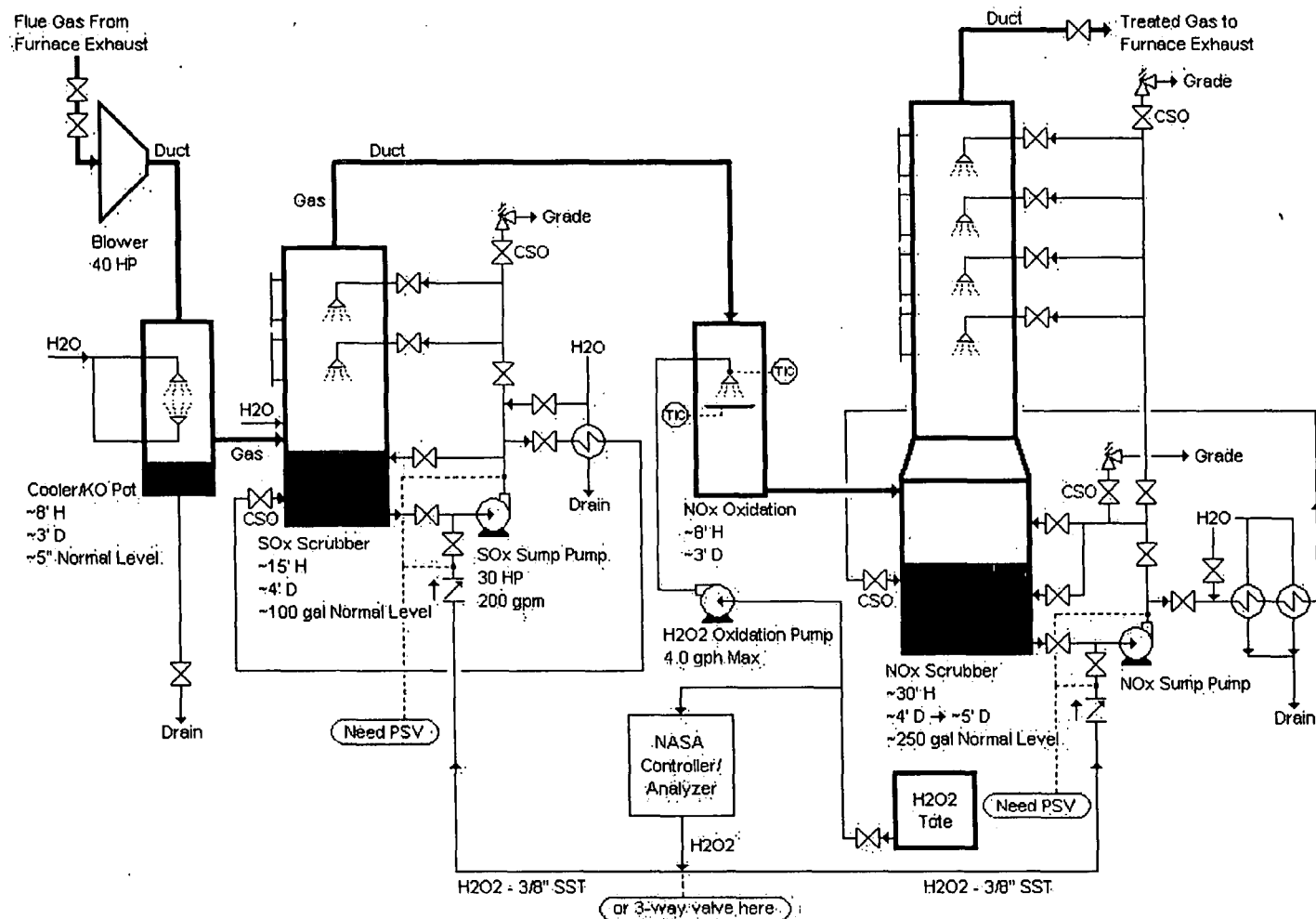




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# 2<sup>nd</sup> Pilot Plant Installation



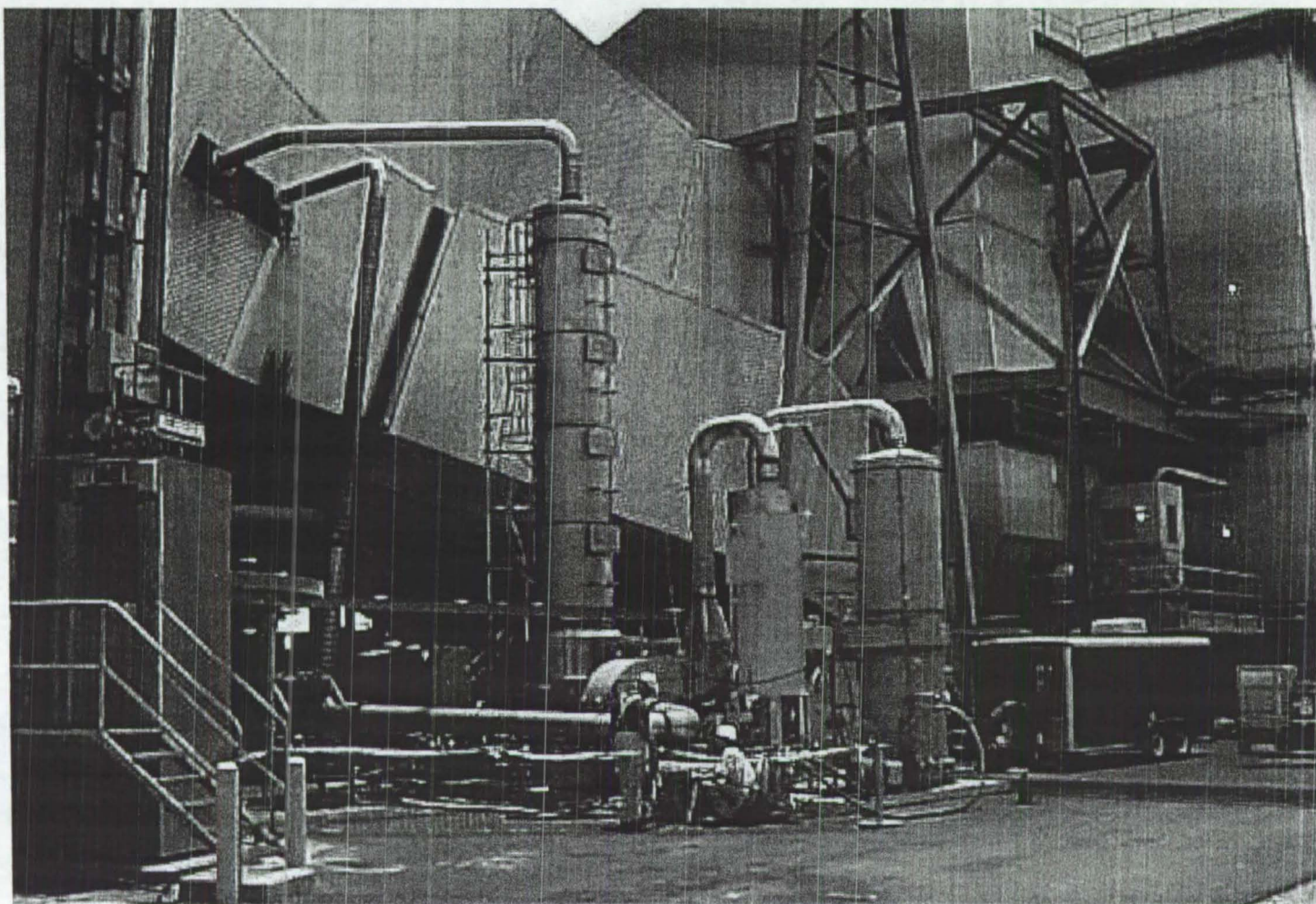




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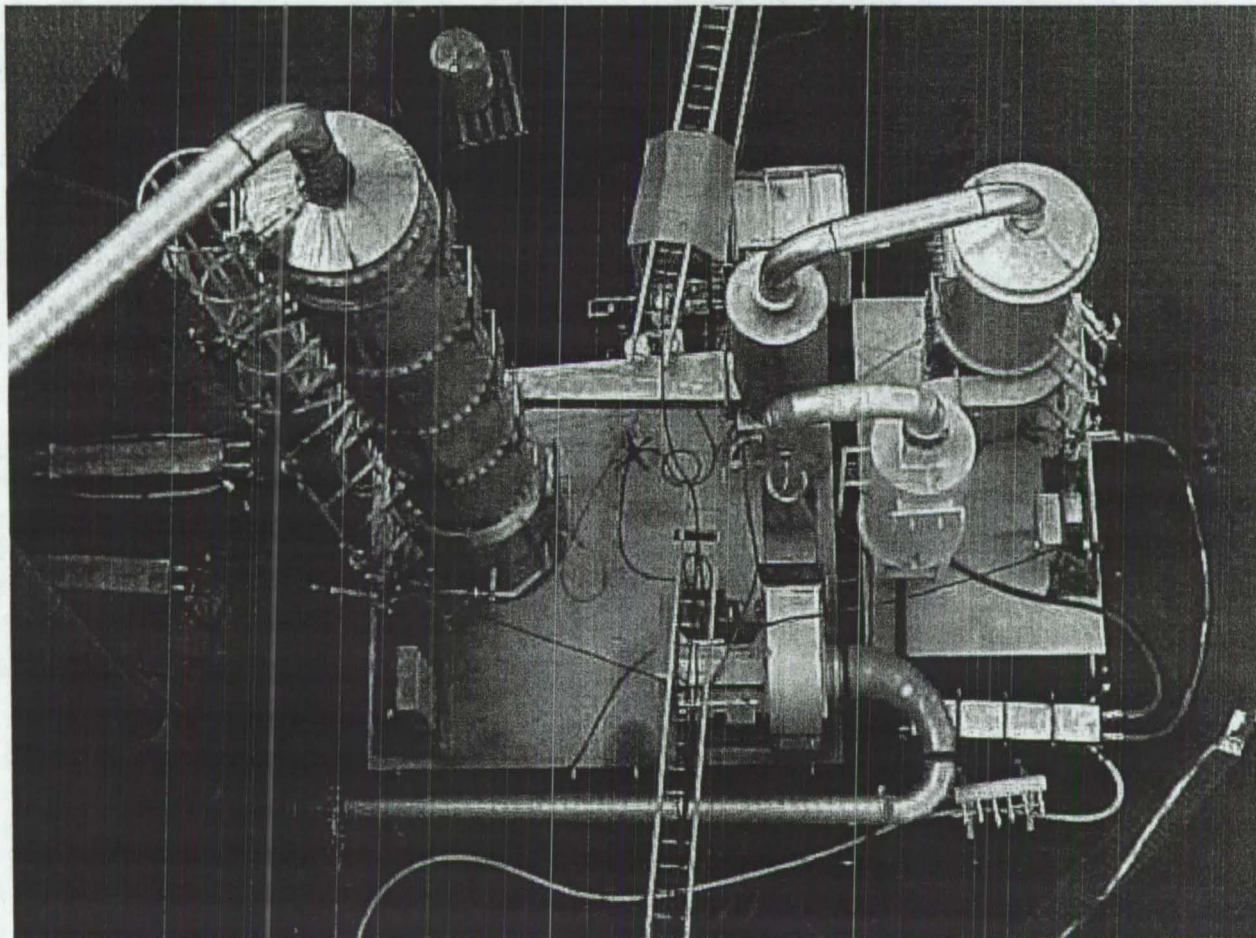
## View 2<sup>nd</sup> Installation







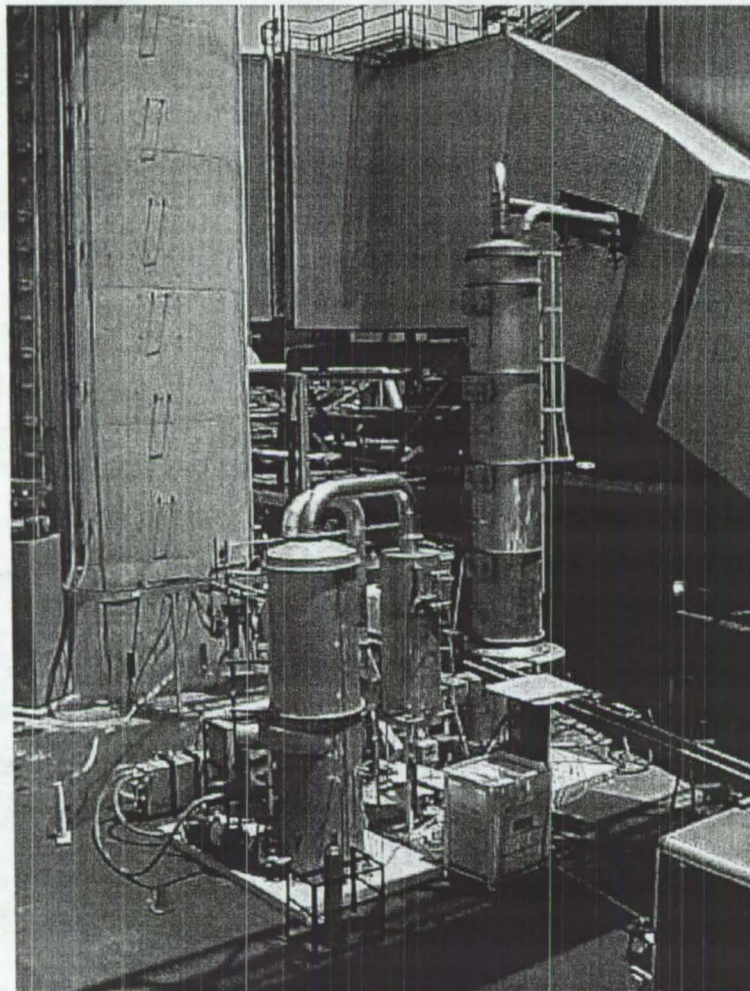
## Top View 2<sup>nd</sup> Pilot Plant







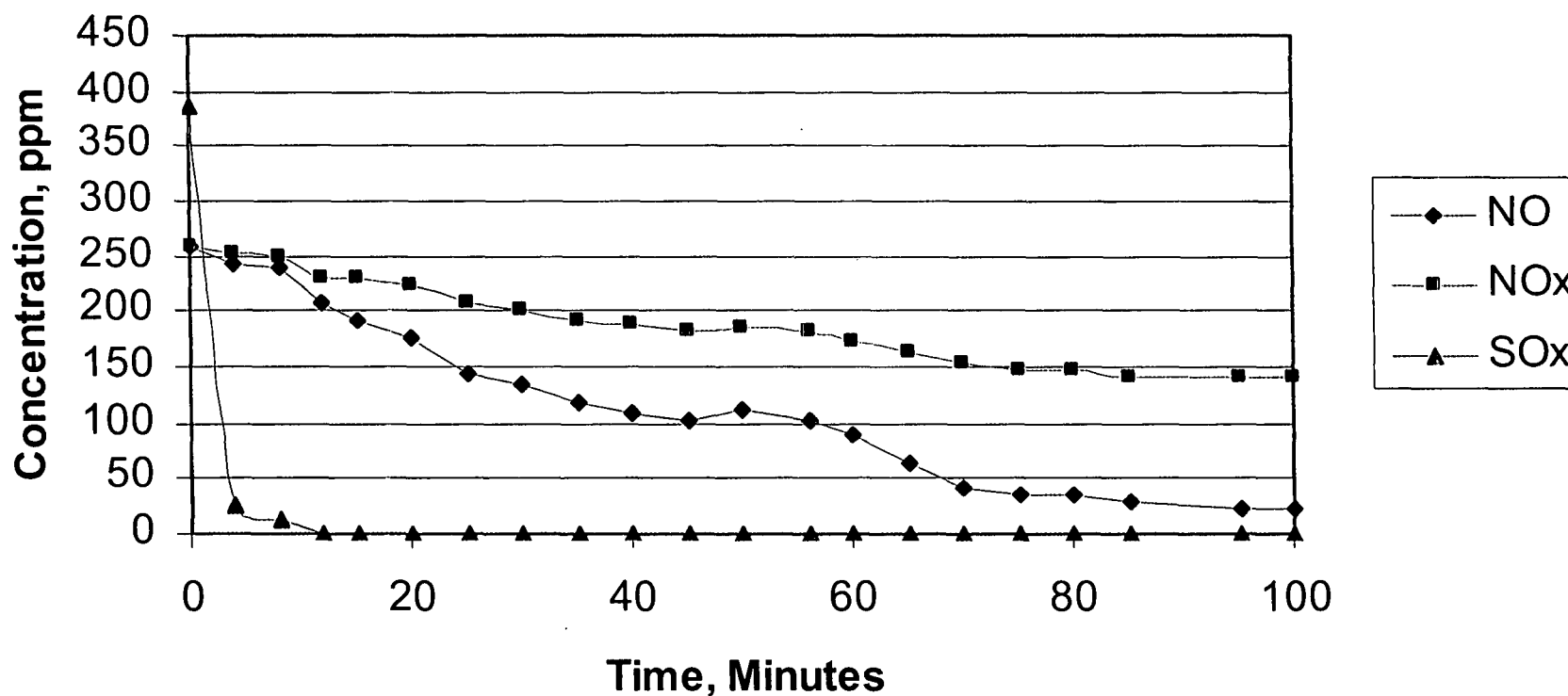
## Initial installation of Pilot Plant





# Pilot Plant Results

## SOx Scrubbing and NO Oxidation







## **Phoenix Systems International, Inc**

- **Company Information**
- **Licensing Experience**
- **NASA Support**
- **Patent Protection**
- **Value of NASA Commercialization Efforts**
- **Teaming with Other Organization**